



# ACST8082

## Contingent Payments

Session 2, Special circumstance 2020

*Department of Actuarial Studies and Business Analytics*

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### Disclaimer

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### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

Unit convenor and teaching staff

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Credit points

10

Prerequisites

(ACST881 or ACST8081) and (STAT810 or STAT8310 or STAT806)

Corequisites

Co-badged status

Unit description

This unit covers the analysis of cash flows dependent on uncertain events due to mortality and other factors. It introduces the concept of the expected present value of payments under various life insurance contracts, including whole life, term and endowment assurances; immediate and temporary annuities; and deferred assurances and annuities. The standard international actuarial notation in life insurance is used extensively. Probability models and life tables are used to calculate the expected present values accurately based on ultimate or select mortality. Furthermore, important concepts of pricing and reserving for future contingent liabilities are discussed. Equations of value are established to calculate net premiums. Prospective and retrospective net premium reserves required to meet future liabilities are determined and compared. Techniques for the valuation of annuity and assurance products involving two lives are developed. Students gaining a credit average in both ACST8081 and ACST8082 (minimum mark of 60 on both units) will satisfy the requirements for exemption from the professional subject CM1 of the Actuaries Institute.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

**ULO1:** Interpret and apply simple survival models as well as ultimate and select mortality

rates.

**ULO2:** Apply contingent payment techniques to determine actuarial present values and variances of benefits for simple life insurance contracts and for contracts contingent on two lives.

**ULO3:** Calculate premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.

**ULO4:** Analyse the profit arising from life insurance contracts in simple scenarios.

**ULO5:** Identify key unit concepts and to integrate them to solve and analyse novel problems.

**ULO6:** Explain how the contingent payment techniques can be applied to complex life-contingent problems.

## General Assessment Information

For all assessments:

- Assessment criteria for all assessment tasks will be provided on the unit iLearn site.
- All individual assessment results will be made available under Grades on the website.
- It is the responsibility of students to view their marks for each within-session assessment on iLearn within 20 working days of posting. If there are any discrepancies, students must contact the unit convenor immediately. Failure to do so will mean that queries received after the release of final results regarding assessment marks (not including the final exam mark) will not be addressed.
- In the cases where a special consideration application is approved, the student may be offered an alternative assessment or may receive a mark based on the percentage mark achieved by the student in one or more other assessment tasks, at the unit convenor's discretion.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Online Quiz</u>	5%	No	Week 3
<u>Assignment</u>	15%	No	Week 8
<u>Class Test</u>	20%	No	Week 10
<u>Final Exam</u>	60%	No	University Exam Period

## Online Quiz

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 2 hours

Due: **Week 3**

Weighting: **5%**

You should complete the quiz online, available on iLearn.

On successful completion you will be able to:

- Interpret and apply simple survival models as well as ultimate and select mortality rates.

## Assignment

Assessment Type <sup>1</sup>: Quantitative analysis task

Indicative Time on Task <sup>2</sup>: 15 hours

Due: **Week 8**

Weighting: **15%**

This is an individual assignment which focuses on problem solving using Excel spreadsheet.

On successful completion you will be able to:

- Interpret and apply simple survival models as well as ultimate and select mortality rates.
- Apply contingent payment techniques to determine actuarial present values and variances of benefits for simple life insurance contracts and for contracts contingent on two lives.
- Calculate premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.
- Identify key unit concepts and to integrate them to solve and analyse novel problems.
- Explain how the contingent payment techniques can be applied to complex life-contingent problems.

## Class Test

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **Week 10**

Weighting: **20%**

The test will be approximately 90 minutes, to be held during class time.

On successful completion you will be able to:

- Interpret and apply simple survival models as well as ultimate and select mortality rates.

- Apply contingent payment techniques to determine actuarial present values and variances of benefits for simple life insurance contracts and for contracts contingent on two lives.
- Calculate premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.
- Analyse the profit arising from life insurance contracts in simple scenarios.
- Identify key unit concepts and to integrate them to solve and analyse novel problems.

## Final Exam

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 28 hours

Due: **University Exam Period**

Weighting: **60%**

The final examination will be closed book, a three-hour written paper with ten minutes reading time, to be held during the University Examination period.

On successful completion you will be able to:

- Interpret and apply simple survival models as well as ultimate and select mortality rates.
- Apply contingent payment techniques to determine actuarial present values and variances of benefits for simple life insurance contracts and for contracts contingent on two lives.
- Calculate premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.
- Analyse the profit arising from life insurance contracts in simple scenarios.
- Identify key unit concepts and to integrate them to solve and analyse novel problems.
- Explain how the contingent payment techniques can be applied to complex life-contingent problems.

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<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

### Classes

It is intended that learning this semester will be a combination of pre-recorded online and face-to-face.

The timetables for classes can be found on the University website at:  
<https://timetables.mq.edu.au/2020/>.

Pre-recorded lectures will be made available early in the week and students are expected to have watched/listened to them prior to attending any live or face-to-face classes.

Classes on tutorial questions will commence in week 2 of the session. Students are expected to have attempted the previous weeks tutorial questions before coming to this class.

### Required and Recommended Texts and/or Materials

No textbooks are prescribed for this unit. Detailed notes, exercises and solutions are available on the unit's web site.

### Technology Used and Required

You will require a calculator. For the final exam, you may only use non-programmable calculators which are not able to store text.

You will also need to be able to construct spreadsheets for tutorial exercises. You will also be required to use a spreadsheet for the assignment. We do not prescribe any particular brand of spreadsheet, although materials will be provided in MS Excel.

You require access to a computer to access material on the unit's iLearn web site.

### Unit Webpage

Course materials, including pre-recorded lectures, are available on the iLearn page.

To access the teaching website, go to <http://ilearn.mq.edu.au> and login using your usual login and password.

## Unit Schedule

The following schedule of topics is also provided as a separate printer-friendly document in the administration section of this unit's iLearn web site.

Week	Week Begins	Topics covered in lectures	Assessment
1	27 Jul	Life tables and survival models	
2	3 Aug	Valuing single payment benefits	
3	10 Aug	Valuing life annuities	Quiz

4	17 Aug	Select mortality Net premiums	
5	24 Aug	Policy values	
6	31 Aug	Variable benefits	
7	7 Sep	Operating expenses Profit testing	
----- 2 week study break -----			
8	28 Sep	Participating policies	Assignment
9	5 Oct	Analysis of profits Profit loading	
10	12 Oct	Joint life and last survivor statuses (class test)	Class test
11	19 Oct	Joint life and last survivorship benefits	
12	26 Oct	Contingent and reversionary benefits	
13	2 Nov	Revision	

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/unitguides/mq.edu.au/unit\\_offerings/128133/unit\\_guide/print\)](https://students.mq.edu.au/unitguides/mq.edu.au/unit_offerings/128133/unit_guide/print)

[mq.edu.au/support/study/student-policy-gateway](http://mq.edu.au/support/study/student-policy-gateway)). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)



## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Changes from Previous Offering

This unit was offered last year as ACST882 and has been expanded to also cover Profit Testing.